Now You See It, Now You Don't

Transparent PLZT Ceramics: A Technology Leaves Home

An electro-optical shutter technology that culminated in protective devices — aircraft windows and pilots' goggles — against thermal and flash effects of weapons finally has been transferred from its Sandian home base to industry.

It can be said that Sandia nurtured this electrically controlled light shutter "from the cradle to the altar." R&D started in 1969 when Gene Haertling (formerly 2317) invented, and Cecil Land and Ira McKinney (both 1112) developed applications for, a transparent ceramic material called PLZT (an acronym for *P*b — or lead — *L*anthanum-modified *Z*irconate *T*itanate). PLZT is the key ingredient in devices that almost instantaneously turn dark in the presence of an intense light such as a nuclear flash.

After 17 years of R&D, "the technology is sufficiently mature and we're ready to bow out," says Jamie Wiczer (2531). "The Air Force has just initiated a $15 million contract to make these windows; that reflects on the good job that Sandia did. Now, Honeywell and its subcontractors — Motorola (in Albuquerque), Polaroid, Tyrolite, and Teledyne — can take over production."

UNDER COVER OF DARKNESS, Bob Cutler (2531) models lightweight PLZT goggles, designed to protect eyes from damage by bright light — and to prevent skin burns around the eyes. The normally transparent goggles can turn dark about 2000 times faster than a bomber pilot's eyes can blink. The assembly includes a cigarette-pack-sized battery, a sweep-on oxygen mask, and a communications headphone.

Dennis Hayes (2530), manager of the Ceramic Components Department, calls the PLZT technology "a good and healthy reimbursable through the Air Force and the Army." According to Dennis, the delivery to the military forces just this past March of Sandia-developed prototypes consisted of 18 windows — plus a spare — for three B-1B bombers (see "Cockpit Windows Upscaled"), 40 lightweight goggles (see "Toward a Shirtsleeve Environment"), and an assortment of goggle lenses and electronics.

"Sandia ran the whole $39 million effort from 1971 on," says Jim Harris (2566). "Production funding for the first model of goggles designed for SAC [Strategic Air Command] was $20 million. Almost $800K went into the window — including installation of manufacturing equipment for the commercial suppliers. Another $18 million in development funding was targeted for both the goggles and windows."

FACE-TO-FACE with a Sandia secretary's photoferroelectric image that he stored 10 years ago on a ceramic "slide," Cecil Land (DMTS, 1112) looks forward to the future as much as he looks back to his early work. For 25 of his 30 years at Sandia, Cecil has conducted many research programs that either have progressed very rapidly or now are stimulating a variety of applications at other labs.

Protection Against Flashes

Both of the protective devices against flash-blindness use a thin, transparent PLZT wafer — sandwiched between two linear polarizers — that transmits almost no light (less than 0.01 percent). Continuous application of 550 V to an electrode array

(Continued on Page Six)

LAB NEWS

VOL. 38, NO. 13 SANDIA NATIONAL LABORATORIES JULY 3, 1986

Executive Secretaries Move Up

On July 1 Thelma Foster, former secretary to Executive VPs Tom Cook (20) and Lee Bray (30), became secretary to President Irwin Welber. Thelma succeeds Rosalie Crawford, who retired June 30 (see LAB NEWS, June 20, 1986). Jo Sena, who was secretary to Larry Anderson (2000), has moved into Thelma's previous job in 20/30.

"The new job is an awesome responsibility," says Thelma, "and I consider it a real honor to have been selected. I have some big shoes to fill [Rosalie's], but I'm looking forward to the experience, and to working for Mr. Welber."

Thelma joined Sandia in May 1961 as a steno-clerk in the purchasing organization. Later that year she became secretary in the Radiation Effects Division. In 1963 she transferred to the Advanced Systems Studies group — in those days called the Labs' "think tank" — and worked there until the following year, when she was promoted to department secretary in the Test Support Department (field test organization).

In 1967 Thelma was named secretary to Byron Murphey (ret.), director of underground experimentation. From 1971-1974, she worked for directors Orval Jones (now 5000) and John Galt (ret.), who headed the solid state research organization during that period. She was promoted to executive secre-

(Continued on Page Two)

BEFORE SHE RETIRED, Rosalie Crawford introduced Thelma Foster (right) to her new office space. Thelma succeeds Rosalie as secretary to President Irwin Welber.

Transpo Fair Rescheduled

Thanks to the rain last week, the Transportation Fair has been postponed until July 8. As pointed out in the last issue, Sandia's Commuter Assistance program, Sun-Tran, and UNM's Ridepool will present information on — and incentives to convert to — various forms of intelligent commuting.

More than $175 worth of prizes will be awarded by drawing to those who fill out a registration form. Put "T Fair, Cafeteria, 11:30-1" on your July 8 calendar page right now.

Antojitos

PLZT -- Some Background It was Larry Anderson (VP 2000) who first suggested our cover story, a sort of wrap-up on PLZT as much of that work heads into the commercial world. Back in the late 60s, when he was a department manager at Bell Labs, Larry learned from one of his division supervisors, Al Meitzler, about Sandia's pioneering work with the material. "Al and Gene [Haertling, PLZT inventor] kept in pretty close touch. We were interested in renewable optical memories -- page composers, we called them -- and PLZT looked promising," Larry recalls. "We didn't continue our work in the area, but it's one that's always fascinated me, and although the work isn't in my group, I've followed developments pretty closely since I came here last fall."

"It wasn't Sandia-sponsored, but it was, in effect, tech transfer -- and certainly a successful example," says Gene Haertling, PLZT inventor. He left Sandia in 1973 and formed his own company, Opto-ceram, to commercialize the material. Within a year or so, the company was purchased by Motorola. Gene's now a manager of Motorola Ceramic Products here in Albuquerque. "PLZT has proved to be commercially successful. Bell & Howell, Kodak, ITT, and, of course, Motorola are all marketing PLZT-based devices or materials." So, thanks to Gene, the city has an industry it wouldn't have had otherwise.

* * *

Paying Off Our Creditors We probably never manage to remember all the people that help us (some simply by not hindering us) as we race to meet our fortnightly deadlines. But I've overlooked a few in these last two issues that I really meant to mention and didn't.

One example is the support people based at NTS -- NTS Staff Division 7131 under B. G. Edwards, and Field Support and Logistics Section 7135-1 under Adam Trujillo (and including our man at McCarran Field in Vegas, Bill West.) If you've ever worked on a program at the Site, or even if you've just visited out there, you know that the logistics can be formidable. But these folks know all the angles, most of the curves, and some of the straightaways, and they can cobble up solutions with Rube Goldbergian creativity. Sorry to forget you, NTSers; guess it was a case of "out of Site, out of mind."

Another overlooked talent belongs to artist (tech and otherwise) Jim Walston (3155-4). Jim did the sketch of Rosalie perimetered by presidential personages on last issue's front page. Jim does elegant penwork, and we were honored to have his work in our paper once again. Next time, Jim, a credit line in boldface.

And sometimes we give credit to the wrong person. Remember the shot of President Hornbeck, Dixie Lee Ray, and her dogs in the last issue? We said it was a Bill Laskar shot. Turns out Bill was busy during the two minutes available for photos, so writer Don Graham (ret.) ran over there and snapped it. "Tough shot," Don remembers. "It was dark in there -- f1.8 at 1/30th." •BH

* * *

Reality is for those of us who can't stand drugs.

JO SENA with her previous boss, Larry Anderson (2000). Jo is now secretary to Executive VPs Tom Cook (20) and Lee Bray (30).

Continued from Page One

Executive Secretaries Move Up

tary in October 1974, when she became secretary to Al Narath, research VP.

During the time she was the VP's secretary, Thelma also served about five years as secretarial coordinator for the organization. "I know lots of people as a result," she says. "Secretaries in that group were located in some 37 buildings, as I recall."

When Al and Tom Cook were named executive VPs in June 1982, Thelma became their secretary. After Al left in March 1984 to become VP of Government Systems at Bell Labs, Lee Bray of AT&T Technologies, Inc. (Greensboro, N.C.) joined Sandia as EVP, Administration. Thelma's worked for Lee and Tom since that time.

Before she moved to Albuquerque from Muscatine, Iowa, in 1960, Thelma worked for the city attorney in Muscatine. She has two daughters and two grandchildren — a boy and a girl. "And I do enjoy spending time with those grandchildren!" she says.

Jo Sena started at the Labs as a division secretary in the library in 1959. She also worked in an engineering division before her promotion to secretary of the Electronic Components Department in 1962. She transferred later to the Electronic Systems Department and was named secretary to Harlan Lenander (ret.), director of manufacturing development, in 1966.

From 1968-1971 Jo was secretary to Dick Claassen (now 8000), director of electronic component development. From 1971-1975 she worked for Klaus Bowers, first when he was managing director (a job title that no longer exists), and then after he was promoted to component development VP in 1972. (Klaus returned to Bell Labs in 1975.)

She's served a succession of component development VPs since: Gene Reed (ret.), John Galt (ret.), and Larry Anderson. Like Thelma, Jo was secretarial coordinator for her organization for about five years. She also assisted Sandia's U.K. coordinator for some 12 years as part of her job in the Org. 2000 office.

Jo's a native New Mexican. She was born in Cerrillos, and graduated from Madrid High School (yes, there really *was* an MHS!). Before she joined Sandia, she worked at various jobs in Santa Fe, Albuquerque, Farmington, and Roswell. Her two sons both work at Sandia — Arthur in Div. 1617, and Richard in Div. 7815. She has two granddaughters.

"I'm excited about my new job," says Jo. "Working for two men instead of one will be different, I'm sure, and I look forward to the challenge."

Sympathy

To Christina Lloyd (7812) on the death of her father in Albuquerque, June 22.

LAB NEWS

Published Fortnightly on Fridays

SANDIA NATIONAL LABORATORIES

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA
TONOPAH, NEVADA
AMARILLO, TEXAS

Sandia National Laboratories is operated by Sandia Corporation, a subsidiary of AT&T Technologies, Inc., and a prime contractor to the U. S. Department of Energy.

BRUCE HAWKINSON, Editor
PHYLLIS WILSON, Writer
IRENE DUBICKA, Writer
RANDY MONTOYA, Photographer
GERSE MARTINEZ, Asst. Photographer
JANET WALEROW, Editorial Assistant
SHELLY BARNES, Assistant
BARRY SCHRADER, Livermore Reporter

Member International Association of Business Communicators

Take Note

The Kirtland Aero Club is seeking pilots and would-be pilots during its membership drive this month. Most members are military, but it's open to Sandia and DOE people as well as other contractors on base. The Aero Club is an approved FAA flight school that provides both flight and ground courses from Private Pilot through Airline Transport ratings.

The club fleet includes 12 single engine Cessna and 1 Beechcraft Baron twin engine aircraft. The club is located in a newly renovated facility in Hangar 482 on Aberdeen Drive. The facility features a group ground school classroom, individual briefing and de-briefing rooms, and a flight planning area complete with all required publications and materials for planning cross-country flights. A new retail sales outlet for pilot supplies and pilot's lounge with a library of aviation books and magazines is available.

The club is attempting to reach a goal of 300 members by the end of September. Free dues for July and a free club patch will be offered to all who join in July. Prospective members can call Gloria Hinshaw at 4-0884 for more information.

* * *

Retiring this month but not shown in LAB NEWS photos are: Kenneth Bixler (5122), Darlene Kraft (7137), Richard Tullar (5127), Evelyn Renker (3743), Mary Walker (2825), and Albert Schnedler (7213).

Beyond the Plane Truth

Artist's Work Hangs Around The World

Tech artist Jack Young (8265) certainly never intended to become an artist. But he loved airplanes as a child, then spent WWII in the Army Air Corps. And he definitely has a penchant for reproducing aircraft on large canvas. Today, these paintings — and his landscapes — are attracting widespread interest.

Jack is currently working on a series of large paintings that will be sent (by a benefactor) to the U.S. Navy Air Museum at Pensacola, Fla. Historically accurate in every detail, the paintings are a sentimental journey back in time for people who remember the old planes.

Jack has done paintings of aircraft for years, but it wasn't "art" back then. He worked for North American Aviation, Boeing, and Lockheed, turning out hundreds of paintings from their drawings. One of his airplane paintings was copied into several thousand color prints and sent out as a promotion by Boeing public relations. An airline presented another of his large paintings to Prime Minister Jawaharlal Nehru of India.

It wasn't until 1971 that a gallery in San Francisco spotted some of his work and convinced Jack to do some paintings for gallery display. Not of airplanes though — "The gallery owner didn't have an eye for airplanes," says Jack. "It was my painting backgrounds that he admired. So he asked me to produce some landscapes in large format (4 by 4 feet)." Jack went home and turned out 11 landscapes in two weeks — and they began selling instantly, at least one a week for the next 10 months.

"That was one of the most prolific periods in my life," Jack recalls. "All the time I was working full-time as a tech artist at LLNL and, on nights and weekends, turning out giant landscapes as fast as the paint would dry." He sold 158 paintings that year.

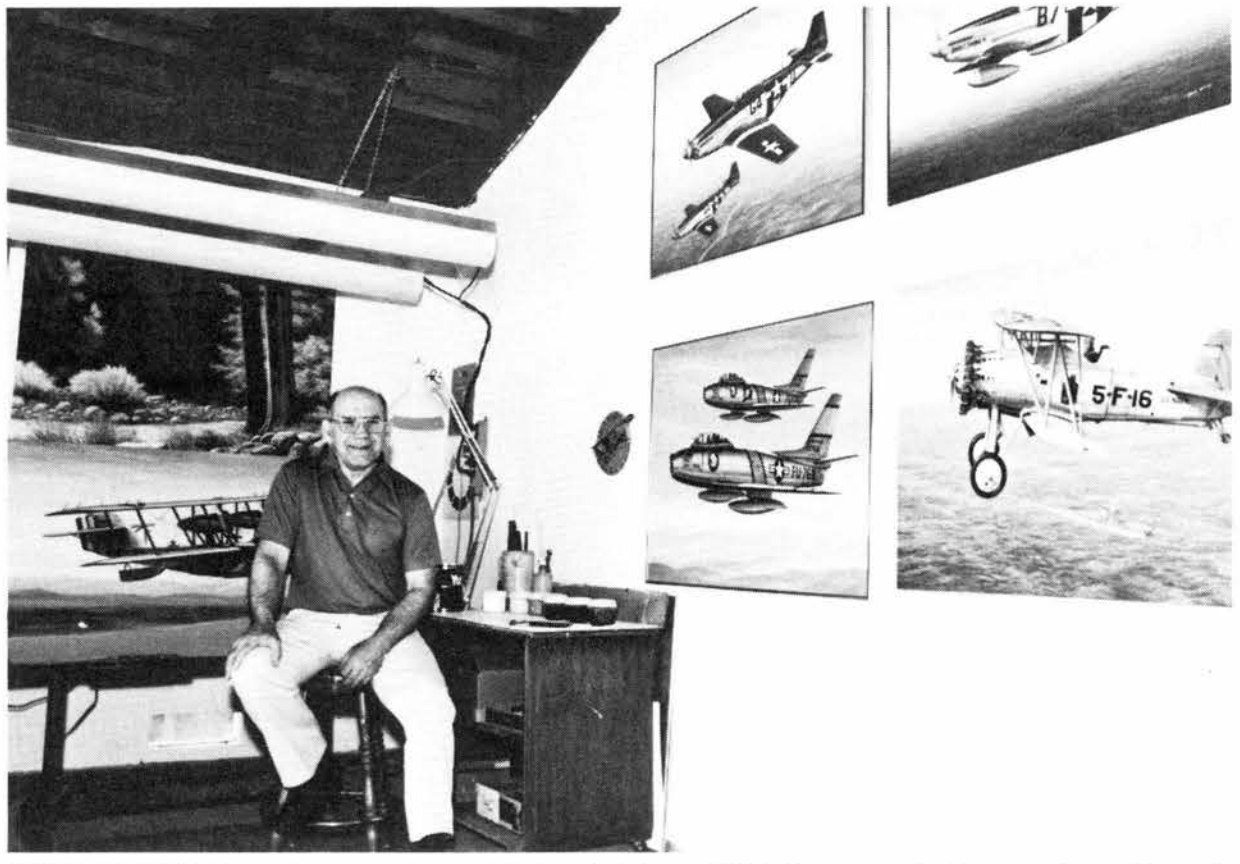
He then decided to move to Carmel and become a full-time freelance artist. Soon his work was spread among eight galleries across the country, from Miami to Oklahoma City to Reno and San Francisco, as well as near home in Carmel.

His biggest challenge was to produce a 21-foot-long scenic mural on the wall of the celebrity entertainers' quarters at Harrah's Tahoe just before Frank Sinatra and John Denver opened there. He got the job done on time, but the day before the entertainers were to occupy the suite, an electrician, trying to locate a thermostat in that wall, cut a six-inch square hole in the painting. Jack had to rush back to Tahoe and patch the hole, repainting part of the scene so it wasn't noticeable.

Harrah's has a number of his landscapes in both casinos and conference rooms in Reno and Tahoe. Jack estimates his landscapes total 600, 200 of them owned by Bank of America alone and hung in offices throughout the West.

The day after he won first place in a West Coast art competition, Jack tried to figure out what it was people liked in his work — "I was always amazed at selling anything. So I went into the garage that I used for a studio and sat down to study 12 large paintings I had just finished. I think I saw for the first time what they really portrayed — a blaze of sunshine with shadows. Yet the longer I looked, the more I realized that they had a soft quietness that dominates everything: color, motion, composition. Beyond that insight, I finally came to realize that painting had become one of the most important things in my life.

"I now paint with almost an obsession to see each painting progress. The glint of the early morning sun on tall grass, the quiet shadows from a lazy oak, the flow of water in a high mountain stream — simply incredible. I wish I could name them all 'The Gentle Hands [illegible]'"



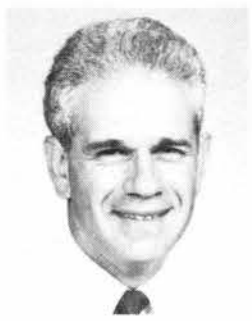
SITTING IN HIS Pleasanton garage-turned-studio, Jack Young (8265) is surrounded by examples of his work. In the upper right hangs a recently done F4B-1 U.S. Navy fighter flying over ships that can be identified by sailors as the 1937-vintage *USS Lexington* and the *USS Saratoga*.

SANDIA LIVERMORE NEWS

VOL. 38, NO. 13 SANDIA NATIONAL LABORATORIES JULY 3, 1986

For Classification Excellence

Halasz Earns Top Award



Frank Halasz (8024) has been awarded the DOE's 1986 Certificate of Excellence for outstanding performance in the field of classification.

Charles Gilbert, director of DOE's Office of Classification, presented the Certificate to Frank during the annual classification officers meeting at Idaho Falls in June. This is only the second year the award has been in existence; only one person nationwide receives it each year.

The award reads in part: "Your dedication and initiative have earned you the respect and admiration of your peers. We commend the significant contributions you have made to Nuclear Weapons Classification."

Frank has worked in classification at Sandia Livermore for 16 years, at Sandia Albuquerque for the 5 preceding. He and his wife Dessa live in Livermore; they have three children.

Congratulations

Gayla and Bob (8176) Chan, a daughter, Kimberly Brittany, June 12.

Scott Anderson (8153) and Cindy Crow, married in Raytown, Mo., June 14.

Steve Margolis (8263) and Shelley Heller, married in San Francisco, June 8.

Pattie and Tabo (8271) Hisaoka, a daughter, Tricia Mieko, June 12.

Pat Beasley (8263) and Jim Devonshire, married in Albuquerque, June 7.

Beverly (8264) and Marv (8444) Kelley, a daughter, Camille Renee, June 10.

Barbara and Dale (8313) Boehme, a son, Blake Robert, June 7.

Supervisory Appointment

DON CHARLESWORTH to supervisor of Personnel Division 8022, effective June 16.

Don joined Sandia in August 1982 as an EEO/Affirmative Action coordinator in Benefits, Medical and EEO Division 8026. Six months ago he became a budget analyst in Budget and Financial Division 8023. He has also been a counselor with the Santa Clara County Social Services Agency for 10 years. He is a state-licensed marriage, family, and child counselor.

Don's education includes a BA degree in psychology from Duke University, an MA degree in the same field from the University of Texas, and an MBA from San Jose State University. He also served three years in the U.S. Army.

He and his wife Linda have a 15-year-old son and live in Campbell. His hobbies are golf and reading.

Take Note

At the Chabot College Valley Campus awards ceremony, Julie Uribe (8360) was honored for high academic achievement in the interior design program. Julie is working toward a certificate in interior design and received the recognition for being the top student in her field.

Sympathy

To Jon Meeks (8351) on the death of his wife in Byron, June 12.

To Carl Schoenfelder (8315) on the death of his mother in Seymour, Ind., June 6.

Fun & Games

Golf — A large field of golfers tried their luck against the water, trees, and deep rough of the University South Golf Course on June 21. The low net winners in each flight were: A Flight: DuWayne Branscombe (2116), 65; B Flight: Jere Harlan (2512), 67; C Flight: Stephen Dwyer (7842), 62; D Flight: Joseph Fernandez (6221), 64; E Flight: Robert Helgesen (7842), 66. The low gross score was turned in by Dick Freeman who shot a 71.

* * *

Tennis — The Sandia Tennis Association will host a doubles tournament at the Coronado Club tennis courts on July 19-20. Events will include men's, women's, and mixed doubles. Entry fees are $5/STA member team and $5 each for guests. Prizes will be awarded to first and second place teams. Entry deadline is July 15. To enter or to obtain more information, contact Judy Hansen (5163) at 4-8889, or Barry Hansen (6224) at 6-4596.

* * *

Swimming — Kirtland Aquatic Club is looking for swimmers for its Masters group (adults). The club has workouts at the KAFB indoor Olympic pool from 5:30-7 a.m. or 6-8 p.m. Mon.-Fri. The entire pool is available in the morning and a number of lanes can be set aside during the evening workouts. Interval workouts and stroke instruction improve speed and fitness. To sign up, contact Don Kase (KAC coach) at the pool at 4-4008 or 298-4969, or Jim Harrison (5111) at 877-5486.

* * *

Running — Upcoming Fun Runs

July	3	NMTC Midnight Run 7K - Albuquerque
	5	Smokey the Bear 10K Run - Capitan
	7	Washington Pass Classic - near Gallup
	12	Los Alamos Mini-Marathon - Los Alamos
	12	Bastille Day - Las Cruces
	12	Partners of America Fun Run - Albuquerque
	19	ARR/RRCA Women's Distance Festival - Albuquerque
	19	Zuni Fitness Series III - Zuni
	19	Kendall Mountain Run - Silverton, Colo.
	20	Sante Fe Triathlon at Cochiti Lake
Aug.	3	La Luz Trail Run 9 miles - Albuquerque
	3	Telluride Get High (MTN RNR) - Colo.
	9	Santa Fe Women's Run 5K - Santa Fe
	10	Magic Mile - Albuquerque
	10	Las Manuelitas 15 Mile Relay - Las Vegas
	16	Zuni Fitness Series IV - Zuni
	17	Indian Ceremonial 12K Run - Gallup
	23	Pike's Peak Ascent - Colorado Springs, Colo.
	24	Pike's Peak Round Trip - Colorado Springs, Colo.
	30	Creede Wilderness Run - Colo.
	31	Save the Jemez Run - Jemez Pueblo
Sept.	6	Imogene Pass Run - Ouray, Colo.
	7	Carrie Tingley Hospital Run - Albuquerque
	13	Lobo Run - Albuquerque
	20	Zuni Fitness Series V - Zuni
	21	NMTC 80K Relay - Albuquerque
	28	Albuquerque Journal Duke City Marathon, half, 5K
	28	Vaquero Days 10K - Las Cruces
Oct.	5	Run to the Radio Towers - Santa Fe
	12	"M" Mountain 9-Miler - Socorro
	18	Sumerford Peak Run Around - Las Cruces
	19	TOA Marathon & Relay Marathon - Albuquerque
	26	Epstein Halloween Run 10K, 5K, 1 M - Albuquerque
	26	South Baldy Ridge (MTN RNR) - Magdalena
Nov.	1	Sandia Wilderness Crossing Research Run
	15	Baylor Pass - Las Cruces
	27	Sun Sports Turkey Day Run - Albuquerque

Retiring

Sam Gaeto (123)

29 yrs.

Paul Bahr (2363)

33 yrs.

Ed Jenkins (3424)

29 yrs.

Jim Phillips (5113)

35 yrs.

Hunter Lewis (7266)

33 yrs.

Roger Buehler (2343)

31 yrs.

Congratulations

To Kim Darby and Mark Garrett (7535), married in Albuquerque, May 31.

To Patty and Roger Shrouf (1112), a daughter, Kelly Leann, June 2.

To Karen Galloway and Mark Brenner (7243), married in Albuquerque, June 7.

To Ginger (6431) and Jim Wilkinson, a son, Jeffery Shane, June 13.

To Sue Glor (7831) and Roy Ricci, married in Albuquerque, June 21.

Brace Yourself

Among corporate captains from here [New York] to L.A., suspenders are back in style. How wild do they get? Peter Elliot Ltd., a men's store that stocks nearly 60 styles, claims that its Rubenesque-nude, fighting-rooster, and Confederate-flag motifs — all of which have been selling well — are some of the most radical. Lately, though, says owner Elliot Rabin, one of the most popular models with businessmen has been that featuring donkeys' back ends. Walter S., a trendy local fashion writer . . . cautions that how [suspenders] are worn makes a crucial difference. "Wrapping 12 pairs around your leg or using them as a head wrap is hip," he advised. "Wearing them the regular way is simply boring."

Diane Petzke, *Wall Street Journal*

For Your Benefit

For Retirees: A Trio of Transamerican Topics

Editor's Note: On-roll Sandians are excused from reading this article, unless they missed it in the *Weekly Bulletin*. But retirees may wish to clip it for their "Medical Insurance" files.

On-Site Transamerica Representative

Transamerica's representative on-site at SNLA is Mary Danen; she is located in the Benefits Dept. (Bldg. 832-East). If you have questions about the Medical Care Plan or need assistance in filing claims, call Mary at 846-1624. However, you are responsible for mailing your Transamerica claims to:

Transamerica Benefit Office
1616 East Indian School Road
Aztec Square, Suite 375
Phoenix, AZ 85016

Deductible Data

Because the Medical Care Plan was transferred from Equitable to Transamerica after the beginning of this calendar year, there have been unavoidable complications in the transfer of deductible history. If your 1986 deductible, or any portion thereof, was met under Equitable, and if Transamerica has taken that same deductible (or any portion thereof) again, please attach the last Explanation of Benefit (EOB) you received from Equitable to the claim in question and resubmit it to Transamerica. The Equitable EOB will be accepted by Transamerica as verification of your deductible status. If you have any additional problems with deductibles, call the toll-free number for Transamerica's Benefit office: 1-800-237-1870 (outside Arizona) 1-800-847-1678 (within Arizona).

Filing Procedure

The "Physician or Supplier Information" box on the claim form does not have to be completed if all of the following are provided on the itemized billing:

1. Name of patient
2. Type of service rendered
3. Itemization of charges and total amount
4. Diagnosis
5. Date of service
6. Name of physician or supplier
7. Prescription number, if a pharmacy billing.

Claims submitted without complete information will be returned to you by Transamerica.

New Law Can Mean 'Bye-bye, BMW'

The dog wasn't mean. Sure he had teeth. But the teeth that concerned me most were the teeth in a new law that could result in my losing my truck to the U.S. government.

Led by his KAFB Security Police handler, the dog gave the truck a good sniffing — glove box, spare tire, wheels, seats, and more. I'd bought the truck just three months ago, and I had no idea whether the kinds of cargo it had carried included any illegal drugs.

You see, there's a "tough new law," to quote from a June 5 KAFB press release ("draconian" might be more precise than "tough"), that says that any vehicle on Base or at the Base gates can be searched. If it contains illegal drugs, it can simply be seized.

The law makes no distinction between civilians and members of the military. And a few marijuana seeds from the time you let your nefarious nephew borrow your car two years ago — or left behind by a previous owner — are enough to trigger the confiscation.

Voilà! You're walking!

KAFB Security Police are using drug-sniffing dogs for the searches. If you're stopped and if your vehicle isn't clean, the SPs report the fact to the FBI, which has the authority to seize your vehicle under the Comprehensive Crime Control Act, as amended in June 1985.

"This new base policy is our effort to comply with the federal law, which targets drug traffickers, though it applies to anyone caught with drugs in their vehicle," says Base Commander Col. Charles Thomas. "We want to keep drugs off Kirtland Air Force Base. If we never again catch anyone coming through our gates with drugs, it would be fantastic.

CHIPPER AT WORK — He's a drug-sniffing member of KAFB's Military Working Dog Section, and he's credited with 140 busts in his career — thus far. He's showing off his skills at the hands of Airman Doug Jester, a member of the Security Police. A tough new law aimed at illegal drugs on the Base can result in vehicle forfeiture. Six civilians have felt the teeth in the law since April 1.

"On the other hand, I enforce the forfeiture provision to the full extent of the law when dealing with drug abuse."

Since April 1, when the program began, seven vehicles (six owned by civilians) have been seized. What happens then is that the government puts a forfeiture notice on the vehicle, then, 30 days later, it belongs to the government.

To keep that from happening, the owner may post a bond of $5000 or 10 percent of the vehicle's value, whichever is less. Once the owner posts bond, the U.S. Attorney must file for forfeiture in federal court. Yes, you may win your case, but is that how you want to spend your time?

So, what can you do if you're not sure how clean your car might be? Simple. Call the Security Police on 4-4618 and ask for a date with a dog.

If your vehicle doesn't pass the sniff test, you'll be shown where you need to concentrate your cleaning. (No, your vehicle won't be confiscated there and then.) After you complete that task, call for another appointment just to ensure that you did a good job.

And if your vehicle does pass, sigh a sigh of relief. I did. •BH

Supervisory Appointments

BARNEY DOYLE to supervisor of Ion Solid Interactions Division 1111, effective June 1.

Barney joined the Labs in November 1977. He has worked since then in both divisions of the Ion Implantation and Radiation Physics Research Department. He has a BS in physics from Kansas State University and a PhD in atomic physics from the University of North Carolina - Chapel Hill. Before joining the Labs he had a post-doctoral appointment in atomic physics at Kansas State.

Barney is a member of the American Physical Society and is chairman of the 1100 Solid State Science Seminar Committee. In his spare time, he enjoys playing golf, table tennis, chess, and bridge; he also plays jazz piano and electronic keyboards.

Barney and his wife Sandra have one son and live in Sandia Heights.

* * *

DICK BURKEN to supervisor of Purchasing Document Production and Administrative Services Division 3735, effective May 16.

Dick joined the Labs in December 1954 as a clerk in the Document Control Division. After transfers through the Shipping and Receiving, Property Auditing, and Road Production Divisions, he joined the General Stores Division in 1959 where he was an order analyst and later a staff assistant. In January 1975, after almost eight years as supervisor of a Shipping and Receiving Section, Dick transferred to Purchasing as supervisor of the Office Services Section. During the past seven years Dick has been actively engaged with the development of Purchasing's computerized document production system.

He enjoys fishing, boating, and traveling in his spare time. Dick and his wife Vera live in the NE Heights.

* * *

DICK ALLEN to supervisor of Numerical Mathematics Division 1642, effective June 16.

Dick came to Sandia June 16 from UNM where he had been a professor in the Mathematics and Statistics Department since 1968. In that time he has been a consultant to AFWL and a visiting staff member at Los Alamos National Laboratory.

He earned a BS in math and physics from Murray State University, an MA in mathematics from the University of Missouri, and a PhD in mathematics from UNM. He is a member of the Society for Industrial and Applied Mathematics.

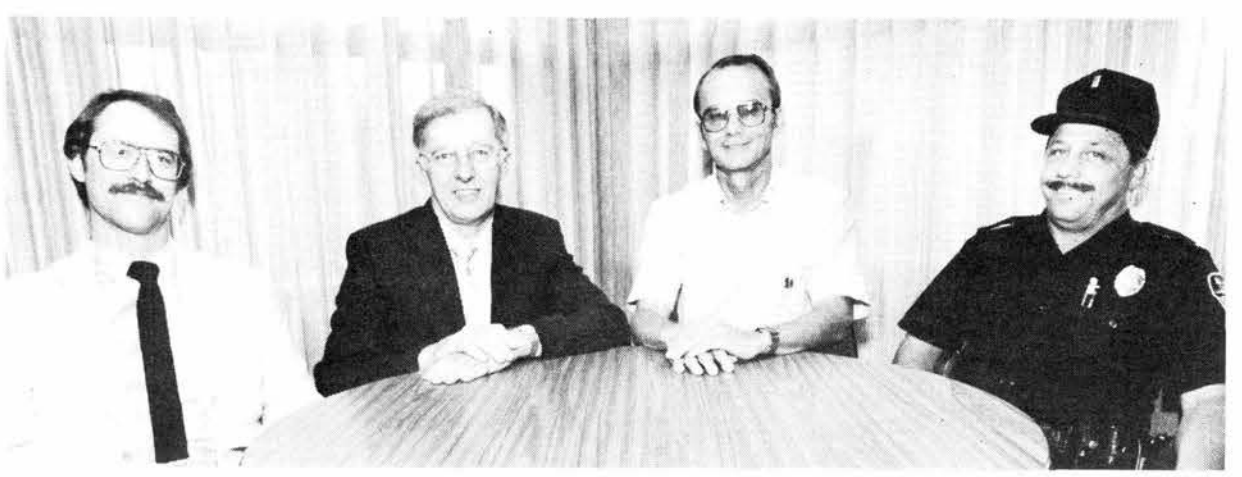
In his spare time Dick enjoys jogging, racquetball, bicycling, and playing duplicate bridge. He and his wife JoAnn live in the NE Heights.

* * *

BOB BURTON to section supervisor (lieutenant) in Patrol Division - North 3434, effective June 1.

Bob joined the Labs in May 1981 and became a full-time security inspector in March 1982. He served in the Navy from 1958 to 1978 in law enforcement. From 1968 to 1971 Bob was an instructor in nuclear weapons at Sandia Base for the Navy. He attended the Reserve Police Academy and worked in law enforcement in Corpus Christi, Tex., in 1975.

Bob is a coach in the Young American Football League. He enjoys playing golf in his spare time. He and his wife Tiffy have two children and live in the NE Heights.



BARNEY DOYLE (1111), DICK BURKEN (3735), DICK ALLEN (1642), and BOB BURTON (3434)

Continued from Page One

PLZT Leaves Home

on the PLZT produces a transverse (crosswise) electric field in the wafer. The field alters incident light so that it can pass through the second polarizing filter. Thus, the applied voltage makes the device transparent. Tiny photodetectors behind the PLZT lens sense when light starts rising to a damaging intensity and switch the goggles OFF. Removal of the voltage returns the wafer to an electro-optically neutral state that results in protective darkness.

The property of PLZT that makes the goggles and windows work — to intercept a flash of light before it reaches the pilots' eyes — is electrically induced birefringence, observed in polycrystalline ferroelectric ceramics for the first time at Sandia (see "Cecil Land Looks Back"). The birefringent PLZT alters the light so that it can pass through the second polarizer (called the analyzer) on demand.

This electro-optic technology "was more than a small application of a nifty idea," says Dennis. "It's difficult enough to make little devices, but it's another thing to make large-diameter, transparent wafers of uniform thickness that are relatively defect-free."

In reality, many new processes had to be homegrown. A number of Sandians helped develop the techniques required to turn the PLZT material into a useful device. The processes include: hot-pressing of six-inch PLZT slugs, by Bob Brooks (2533) and Gary Snow (2534); slicing the slugs into wafers and polishing them to optical quality, George Laguna (2534); and electroding the polished wafers and bonding them between crossed polarizers, Jim Harris, Dick Adams and George Dulleck (both 2534) designed the associated electronics, and Bob Cutler (2531), Jack Cyrus (1621), and Chris Christensen (2543) designed the mechanical hardware. Additional work was done by Tom Cutchen (2560) to integrate the PLZT goggles with chemical protection systems.

Light Shutter Spinoffs

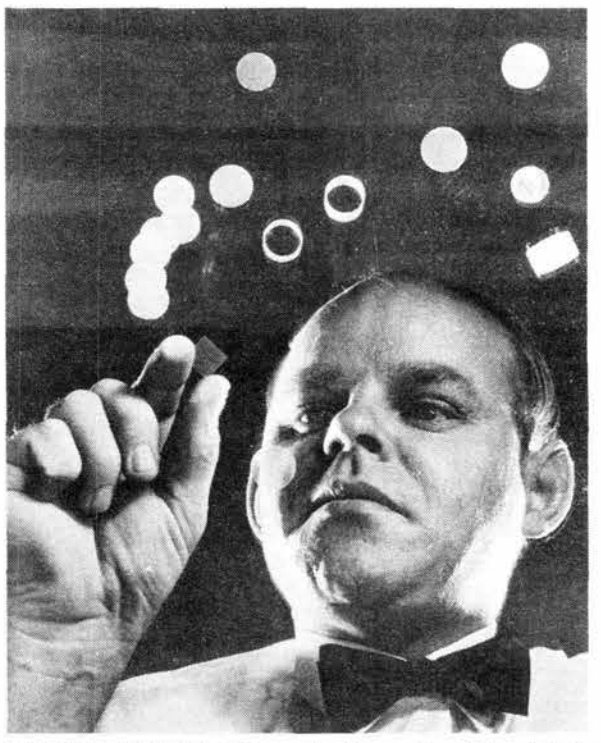
Like any teenager leaving home, the PLZT technology has left a few odds and ends stored in Sandia's attic. PLZT goggles with additional electronic circuitry, developed by Glen Corbett (7483) and Tom Cutchen, have found an end-use at Sandia. These goggles allow workers to electronically select different light levels while they are arc-welding thermal battery containers or flame-spraying metallic coatings.

Other arranged marriages are also in the works. An optical sensor of electrical fields has been developed — and transferred to outside sources. This sensor would allow a worker to actually "see" whether high-voltage capacitors — such as those to be used for the PBFA II facility — are charged or not. The sensor would be permanently connected to the terminals of the capacitor. The worker would shine a light on it: If a high electric field is present, the PLZT device would turn ON and transmit the light to a mirror. A bright bounceback of the light would thus act as a warning signal.

A PLZT device called a programmable spatial light modulator also has been developed to create highly accurate topographic maps in three dimensions (3-D). The modulator directs a laser beam through a 2-D shutter array in a PLZT lens so that a series of light stripes is projected on a solid object. When viewed from the side, the stripes illuminating an irregular object appear to be distorted. By analyzing how the various patterns of light stripes curve or bend around the object's contours, one can calculate — via computer — the object's surface dimensions. Because the light patterns can be preprogrammed to adjust very rapidly for shape change or movement, real-time dimensional information can be obtained — and then used to help identify the object. (Two prototypes already have been delivered to the Air Force.)

That's not the end of the tech transfer story on PLZT. There remain a few more Sandia brainchildren to marry off. Other PLZT devices developed here include 3-D television, protective shutters for sensors, a holographic input/output shutter array called a page composer, a miniature light gate for linking optical fibers, and variable density and color filters for cameras.

MOMENT OF TRANSFER: A production EDU-4/A window is handed to Maj. Gen. Peter Odgers, director of B-1B program, by Jim Harris (2566, formerly 2531) last March at Wright-Patterson AFB. Jim was presented later with a plaque recognizing Sandia for bringing the PLZT application all the way through to a manufacturable product. "We're pleased that Sandia's so well-recognized by the Air Force and the Army as a high-quality engineering lab and as a good supplier for their needs," says Jamie Wiczer, supervisor of Ceramic Components Development Division 2531. (Air Force photo)



BACK IN 1970, PLZT inventor Gene Haertling (2317 at that time, now at Motorola) demonstrates the relative transparency of one of the first samples of PLZT (the dime-size square shape between his fingers), behind a sheet of plexiglass.

From Dakotan Winters to Texan Summers

Cockpit Windows Upscaled

More than any other Sandian, Jim Harris (2566) has been associated with improvements in the process and design of PLZT viewing ports in cockpit windows. The overall goal throughout the past 15 years has been to ensure the protection of bomber cockpit crews and their instruments from a number of nuclear weapons effects, both direct and indirect. (Complete eye protection, for example, requires blocking high intensities of not only visible light but also the ultraviolet and infrared ends of the spectrum.)

- After 1980, the Achilles' heel of the electro-optic project was delamination of the window-sealing gel upon exposure to swings in temperature. "In Albuquerque, if you leave a car parked in the summer sun for a few hours you get an airspace heated to 120 degrees F or more," says Jim. "Yet SAC planes on alert have to function at peak capacity in both North Dakotan winters and Texan summers. Their windows have to withstand repeated exposure to extreme temperatures on both ends of the scale."

A flexible edge seal then was devised at Sandia that could expand and contract like an accordion. Now the 5.9-inch window can withstand numerous temperature fluctuations over a range of -40 to 165 degrees F.

- The original PLZT devices degraded in the presence of moisture. (Earlier-vintage goggles have to be stored in desiccant-packed containers.)

A new, hermetic glass-to-metal seal, developed by Bob Cutler (2531) and Jim, makes the windows and the latest, lightweight goggles impervious to long-term high humidity and high temperatures.

- Discoloration — because of trapped electrical charges — was another weak link in the chain a decade ago, according to Jim. Operating the window panes in their clear state — with constantly applied voltage — for four hours on any given day produced a mottled yellowish tint. What's worse, the dark state — triggered when the voltage is interrupted — was then impaired as well.

Subsequent application of a new gel and new gel-fill techniques, as well as additional prebonding treatments to the polarizer, eliminated noticeable "space charge effects." The window panes can now be used continuously in their clear state for a minimum of 12 out of 24 hours.

- "The windows also were hardened against thermal radiation," says Bob. Extensive thermal testing at Sandia's solar Central Receiver Test Facility of the various window components led to a number of design improvements. For example, the polarizer structure was modified, and the IR-absorbing filter was tempered and separated from the rest of the PLZT lens by an air gap.

- Enclosure — in metal — of all electronics and interconnections in the PLZT window also has hardened it against thermal radiation and electromagnetic pulses, as well as against electromagnetic interference.

- Transmission of light in the visible part of the spectrum is close to 20 percent in the clear state — better than the 18-percent average of the older goggles — even with some loss as a trade-off for thermal hardening. The greater transparency is due to new polarizers developed by Polaroid.

- Finally, the electronics also have been upgraded. Faster switching to the dark state is now possible by use of current-controlled discharge, developed by George Laguna and George Dulleck (both 2534). And, finer tuning of the electrode gaps permits lower power consumption.

Electronic Eyeblinking

Toward a Shirtsleeve Environment

The old way of protecting aircrews against loss of vision from nuclear bursts was to have them wear gold-plated visors (3-percent transmission) during the day and one opaque eye patch at night. The next step was a hood that discharged carbon black — just once, and stayed dark. When the danger was past, the pilot would remove the hood.

Sandia's development of PLZT goggles that blink on and off electronically has not only allowed more protection against temporary loss of vision — or flashblindness — and retinal burns, but also the creation of a shirtsleeve working environment in high-performance aircraft.

The goggles can now turn dark in about 75 millionths of a second. This off state is triggered when the intensity of light doubles in 100 millionths of a second or less. And dark is *dark:* Only 0.005 percent of incident light is transmitted through the goggles. In the clear state, transmission is almost 20 percent — for comparison, a good pair of civilian sunglasses transmits about 15 percent. And, the clear state can be reached again in two-tenths of a second after the hazard is gone. What's more, PLZT can be pulsed many thousands of times without fatiguing.

Intense light from a nuclear detonation — or, for that matter, a lightning flash, which also imperils eyesight — is reduced by a factor of 1000 within 75 millionths of a second and by a factor of about 50,000 within one-thousandth of a second. That's much faster and more efficient than a pilot's eyelids — the wearer may even be unaware that the goggles have "blinked."

Each of the goggles has two 3.9-inch PLZT lenses for the straight-ahead view and two smaller side pieces for peripheral viewing.

The first goggle production run — 4000 pairs for SAC — was made in 1978, and was completed by 1982, overseen by Chris Christensen (2543). These goggles are now employed in B-52s, KC-135s, and FB-111s.

The newest prototypes are lightweight (7.7 oz.). Forty pairs of these goggles were delivered three months ago to the Air Force: 10 for mounting on helmets for fighter pilots in the chemical defense program and another 30 of a headband version (with the electronics packaged separately) for tanker pilots — who don't wear helmets.

The rate-of-rise light detectors used in the original goggles can be replaced or even supplemented with threshold detectors. These "Dial-A-Shade" circuits — which allow the user to select a specific level of light transmission through the lenses — can be useful to fighter pilots flying toward the sun.

Cecil Land Looks Back

Cecil Land (DMTS, 1112) has earned more U.S. patents while working at the Labs than any other Sandian. And all 10 (plus some 40 foreign ones) deal with ferroelectric ceramics — such as PLZT — and their applications.

Cecil's collaboration over the years with Gene Haertling (who invented PLZT in 1969 and specialized in materials work), Paul Peercy (1140) — photo effects and ion implantation, and Ira McKinney (1112) — device fabrication, has combined many useful optical properties of PLZT. The harvest? A recognized body of work with a wealth of applications that is expected to become part of a growing trend: optical communications and information processing technologies (see "Holographic Storage" story).

Strangely enough, the idea of optical information storage hasn't always been on a meteoric rise. "Research on PLZT optical-memory devices tapered off in the late 70s and early 80s," says Cecil. "Then it picked up in the last three or four years. That's because such research applies also to optical information processing and control, a major aspect of communications technology."

Reaffirmation of Faith

Last month at an IEEE convention, Cecil's faith in PLZT's role in optical device technology was reaffirmed. "The field looks like it's growing very fast," he says. "There are more and more proposed applications." And Cecil received the first award from IEEE's newly formed Ultrasonics, Ferroelectrics, and Frequency Control Society; the plaque cites his work in the field of ferroelectrics.

One of the most exciting — yet not so readily apparent — clues to the versatility of PLZT ceramics is that they are transparent to visible light and their transparency can be controlled by an electric field. "Before Gene invented PLZT by adding lanthanum to PZT, there was no such thing as a polycrystalline electro-optic ceramic," says Cecil.

What's more, PLZT ceramics are both piezoelectric (from Greek for pressure + electric) and ferroelectric (from Latin for iron + electric) over certain temperature ranges. What that means, on the piezoelectric end of things, is that PLZT's crystalline dimensions can be expanded or contracted by applying voltage. The ferroelectric property, in turn, implies that each of PLZT's ceramic grains has a number of microscopic polar regions called "domains" that scatter visible light. If an electric field is applied to align the domains parallel to the direction of light transmission, light scattering is minimized and the ceramic appears transparent. Conversely, if the domain's optic axes are switched perpendicularly to the transmitted light, the light is scattered out of its normal path and the ceramic becomes dark.

Selective Switching of Light

When the Sandia scientists discovered and characterized the variety of PLZT's optical properties, they saw potential for selectively switching light transmission off and on in localized areas. As it turned out, these areas could be as small as 10 millionths of a metre in diameter — 10 such areas would fit into the thickness of a single LAB NEWS page.

The next step was the realization that not only transparent and opaque but also intermediate gray areas could be created from different amounts of light scattering. Hence the intensity modulation used for storing 2-D, black-and-white information in slices of PLZT makes possible some new, almost sci-fi devices for storing, erasing, displaying, and restoring visual images.

One of Cecil's earlier inventions, the image-storing Cerampic device (see LAB NEWS, March 30 and May 26, 1972), is obsolete now. "Originally, we used photoconductive film deposited on the surface of PLZT in order to store information," he says. "Then, in 1976, Paul Peercy and I found that we could store this information in the ceramic without using photoconductive film (see LAB NEWS, Nov. 26, 1976). The ceramic itself was photosensitive enough — to ultraviolet light — to store high-quality photographic images" in positive form (like a slide).

Cecil and Paul then spent several years collaborating on ion implantation techniques (LAB NEWS, Sept. 19, 1980) to enhance the ceramic's own photosensitivity even more. "We increased it by a factor of more than 10,000, and may still be able to squeeze another order of magnitude out of it," says Cecil.

PLZT is now the most photosensitive, nonvolatile image-storing material that is erasable and reusable, according to Cecil. Once the image is stored, it won't fade out unless it's erased electrically. As evidence, Cecil pulls out a thin, round disk: a quarter-sized picture of a Sandia secretary that he's kept in his desk for 10 years. "Esther Perea's PLZT picture has been published in more technical journals than any other that I know," he explains. In fact, thanks to his technology, her face may be better known in the field than Cecil's.

"IT'S NOW EASIER to be enthusiastic about all the work that remains to be done," says Cecil Land (DMTS, 1112), after receiving the first-ever certificate of recognition from IEEE's Ultrasonics, Ferroelectrics, and Frequency Control Society. The plaque cites Cecil's "outstanding work on the piezoelectric and electro-optic applications of ferroelectric ceramics" and his key role in guiding the 30-member IEEE Ferroelectrics Committee as chairman for the past eight years. The award was presented during a symposium banquet at Lehigh University on June 9.

More on PLZT next page

Holographic Storage: Newest Wave

A 3-D picture that can be changed later — that's the newest promise for PLZT ceramics.

The ceramics could replace photographic film for holographic storage, a form of 3-D photography. The specific applications are those requiring periodic changes of the stored information. In fact, Cecil Land (DMTS, 1112) co-authored a poster presentation on the subject at the IEEE International Symposium on Applications of Ferroelectrics last month — the first time such an application was reported for the ferroelectric phase of PLZT.

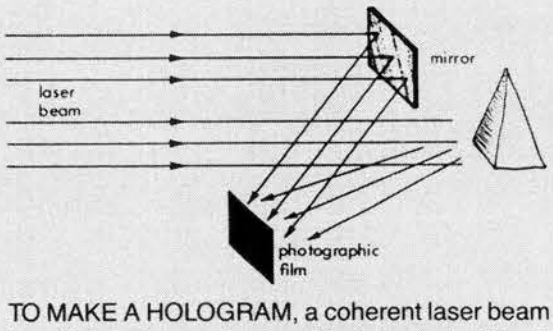
'There is a capability here for high-density, large-area, erasable, and reusable information-storage devices that simply can't be accomplished at present with any other known optical storage media.'
— Cecil Land (1112)

''There is a capability here for high-density, large-area, erasable, and reusable information-storage devices that simply can't be accomplished at present with any other known optical storage media,'' he says. ''Optical information stored in PLZT can produce either intensity modulation [see ''Cecil Land'' story] or phase modulation of transmitted light.''

A segment of PLZT equivalent in size to a cross-section of human hair, some 80 millionths of a metre in diameter, may be able to store as many as 60 bits of information.

In this context, PLZT's capabilities are nothing short of outstanding. A segment of PLZT equivalent in size to a cross-section of human hair, some 80 millionths of a metre in diameter, may be able to store as many as 60 bits of information. It has already been demonstrated that spatial light modulators can switch light in these small, selective areas. The information can be stored in parallel (as opposed to series) format.

PLZT can be used instead of photographic film for holographic storage of information. A hologram is a recording of the interference pattern produced by the interaction of two or more light waves that usually have phases derived from a split laser beam. Reconstruction of the 3-D image for viewing is accomplished by illuminating the interference pattern with one of the coherent (uniformly phased) light beams.



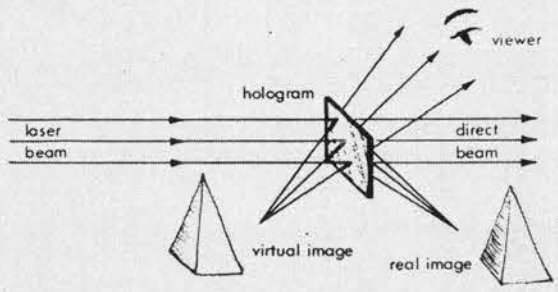
TO MAKE A HOLOGRAM, a coherent laser beam is split into two parts: an object beam for illuminating the subject and a reference beam that is reflected onto photographic film — or PLZT — by mirrors. The light bouncing back from the subject interferes with the reference beam to form within the PLZT a pattern of wavefronts of light that were reflected from the subject.

In holography, visual images are stored in PLZT as phase information (positions of the peaks and troughs of light waveforms), as opposed to our usual notion of images in which differences in intensity are what we see. It's as if the PLZT were a piece of plastic and the phases of coherent light transmitted through it were a row of BB shots, all lined up evenly. The BB shots, or synchronized wavefronts of light reflected from the subject, pass more slowly through some spots in the PLZT than through others. The process produces the equivalent of a textured surface, with shallow and deeper pits. This ''frozen'' pattern of variously slowed-down phases of light in the PLZT would appear in a meaningless form (as variations in the refractive index) to the human eye. However, a laser reference beam (using the same angle as the storage process) and some fancy optics can be used for reconstruction of the image so that it can be observed with the naked eye. This works because the reference beam is altered by the pattern stored in the ceramic, converting it back to intensity-modulated light and producing a visible image made up of bright and dark patterns.

The work Cecil has cut out for himself is ''to achieve periodic updates of holographic storage with time constants in the same range as commercial television'' (30 frames per second). Already there is a need for devices with this capability.

A U.S. Air Force application, for example, requires a spatial light modulator device that can correct a laser beam for distortions encountered in the optical path. One way of doing that, according to Cecil, is to make repeated holograms of the distortions and then use the holograms to filter the laser beam.

One of the most important research areas today is PLZT thin films, according to Cecil. ''For example, there have been some phenomenal successes along this line at Matsushita,'' he says. ''Researchers there came up with a single-crystal thin film of PLZT that has tremendous potential as an electro-optic modulator for optical integrated circuits. Motorola here in Albuquerque is also working on PLZT thin films.''



A HOLOGRAM IS SEEN by a viewer as a 3-D reproduction of the subject. When a coherent beam is directed at the hologram, part of the beam is deflected from the hologram, and the original light wave pattern that came from the subject is reconstructed. The virtual image is so life-like that the viewer can peer around it and "see the subject" from various angles.

PLZT devices are a potentially significant part of a larger phenomenon: the widening use of optical fiber technology in satisfying modern requirements for high-speed exchange of data. Many office complexes here and abroad (particularly in Japan) already are linked by optical fibers instead of conventional cables or microwave systems. AT&T Technologies is riding the new wave in communications as well: It has projected $10 billion for research on such technology by the year 1995.

Hence, Cecil's current enthusiasm about the field. His current interests in PLZT include optical and electro-optic properties, and their applications to information processing, communications, and storage.

Events Calendar

July 3 — Summerfest, Noontime Concert: ''Broadway Elks'' (rock-a-billy, blues), 12-1 p.m., Civic Plaza.

July 3 — Old Town Optimists Fireworks Display, Racetrack, New Mexico State Fairgrounds, 265-1791.

July 3-Sept 30 — Exhibit, Ye'ii, Ye'ii Bichai and Navajo dry painting ceremonial tapestries; 9 a.m.-4 p.m. Mon.-Fri., 10 a.m.-4 p.m. Sat.; Maxwell Museum of Anthropology, 277-4404.

July 3-August 17 — ''Tierra Sagrada,'' a bilingual, romantic musical about life and love along the Rio Grande; 8 p.m. Fri.-Sat., 3 p.m. Sun.; La Compania de Teatro de Alburquerque, El Nuestro Teatro; 256-7164.

July 4 — Arts and Crafts Fair, Indian Pueblo Cultural Center, free, 843-7270.

July 4 — New Mexico Symphony Orchestra Annual Fourth of July concert, fireworks, free admission, 8 p.m., Taylor Ranch.

July 5 — Summerfest: ''Taste of Albuquerque,'' New Mexico chefs and cooks present their best foods; 4-10 p.m., Civic Plaza.

July 5-6, 11-13 — ''George M!'', musical based on life of George M. Cohan; (gala opening 8 p.m., July 5) 2:30 p.m., July 6 & 13; 8 p.m., July 11 & 12; benefit for the Statue of Liberty Fund; Kimo, 848-1370.

July 6-28 — Contemporary Women's Art, exhibit; reception for artists, 2-4 p.m., July 6; South Broadway Cultural Center, 898-1320.

July 8-13 — NM Amateur Quarter Horse Association, Horse Arena, NM State Fairgrounds, 345-3725 or 296-5424.

July 8 — NM Ballet Company 1986 Gala Benefit, featuring soloists from the Royal Danish Ballet, 8:15 p.m., Popejoy Hall, 884-9443.

July 10 — Summerfest, Noontime Concert: ''Dr. Jazz'' (6-piece band), 12-1 p.m., Civic Plaza.

July 11 — Summerfest, Friday Evening Gala: KDEF presents ''Big Band'' (live), 5:30-9 p.m., Civic Plaza.

July 11-27 — ''On Golden Pond''; 8:30 p.m., Fri.-Sun.; Corrales Adobe Theatre, 898-3323.

July 11-August 10 — ''Top Girls'' by Caryl Churchill; 8 p.m., Fri.-Sat.; 6 p.m., Sun.; Vortex Theatre (Buena Vista & Central), 247-8600.

July 12 — Summerfest, French Festival: ''Le Bal Du Quatorze,'' 5-11 p.m., Civic Plaza.

July 12 — ''Fiestecita: A Party on the Mesa,'' La Compania de Teatro de Alburquerque annual fundraiser; New Mexican and American buffet, entertainment, dancing, door prizes; 5-11 p.m., University of Albuquerque ballroom, 256-7164.

July 13 — Arts in the Parks, Fiesta Day: Mariachi Tapatio, Los Reyes de Albuquerque, Los Bohemios, South Side, a Flamenco and a Brazilian dance group, and more; free; 12-5 p.m., Old Town, 764-1525.

July 13 — Chamber Orchestra of Albuquerque, ''Il Signor Bruschino'' Overture by Giacchino Rossini, 8:15 p.m., Albuquerque Little Theatre, 247-0262.

July 14 — Cochiti Pueblo Feast Day, 465-2244.

July 14-20 — Arabian Regionals Horse Show, Horse Arena, NM State Fairgrounds, 836-3033.

July 14 — Lecture Under the Stars: ''The Valley Where Man Was Born'' presented by Roy Smith, Expedition Leader, Omo River Valley, Ethiopia; slides and lecture, no admission charge, 8 p.m., Keller Hall.

July 15 — KiMo Kid Flicks: ''The Fabulous Fleischer Folio,'' ''Hoppity Goes to Town''; 1:30 p.m., KiMo, 848-1374.

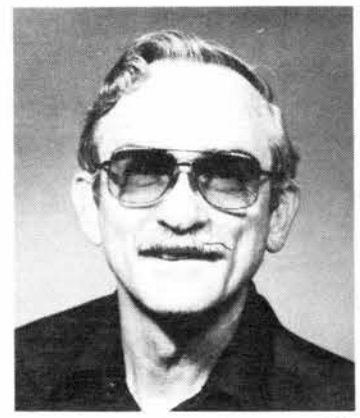
July 17 — Summerfest, Noontime Concert: ''Black Tie'' (5-piece band), 12-1 p.m., Civic Plaza.

July 17 — KiMo Kid Flicks: ''The Red Balloon,'' ''Mickey Mouse Nostalgia''; 1:30 p.m., KiMo, 848-1374.

July 18 — Summerfest, Friday Evening Gala: ''Broadway Elks'' (rock-a-billy, blues), 5:30-9 p.m., Civic Plaza.

MILEPOSTS
LAB NEWS

JULY 1986



Dick Griffith (2314) 30

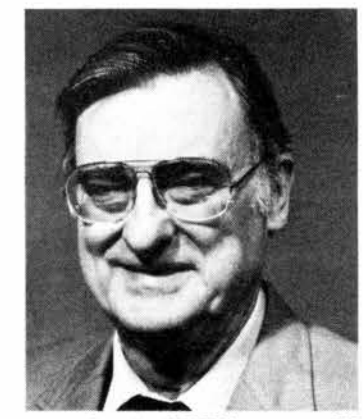
Harriett Skoog (8350) 20

Ken Lee (8271) 10

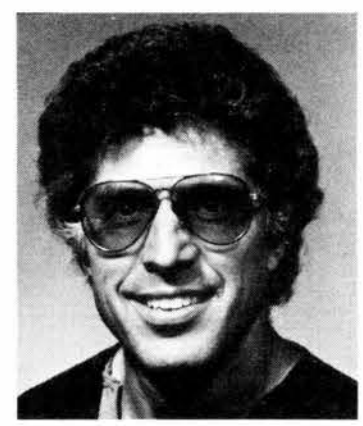
Dale Landis (2855) 30

Roger Baroody (8180) 35

Fred Hart (8255) 10

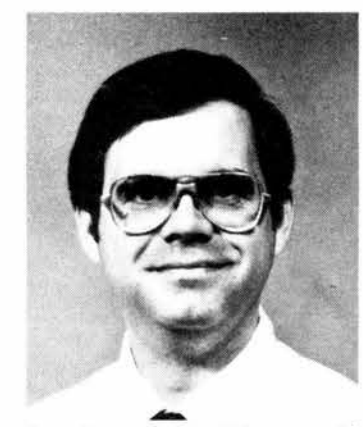


Alan Swain (7223) 25

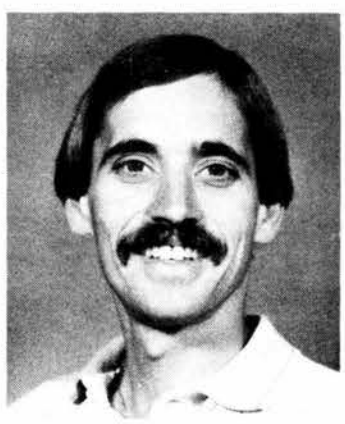


Del Gutierrez (7818) 20

Bruce Koopmann (8274) 10

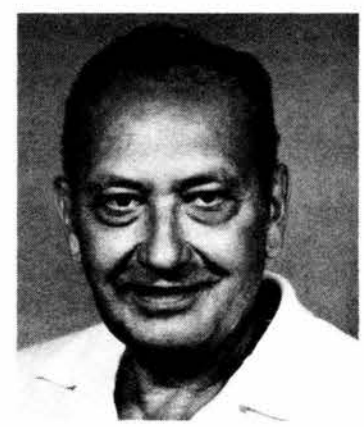


Ron Hartwig (5155) 10

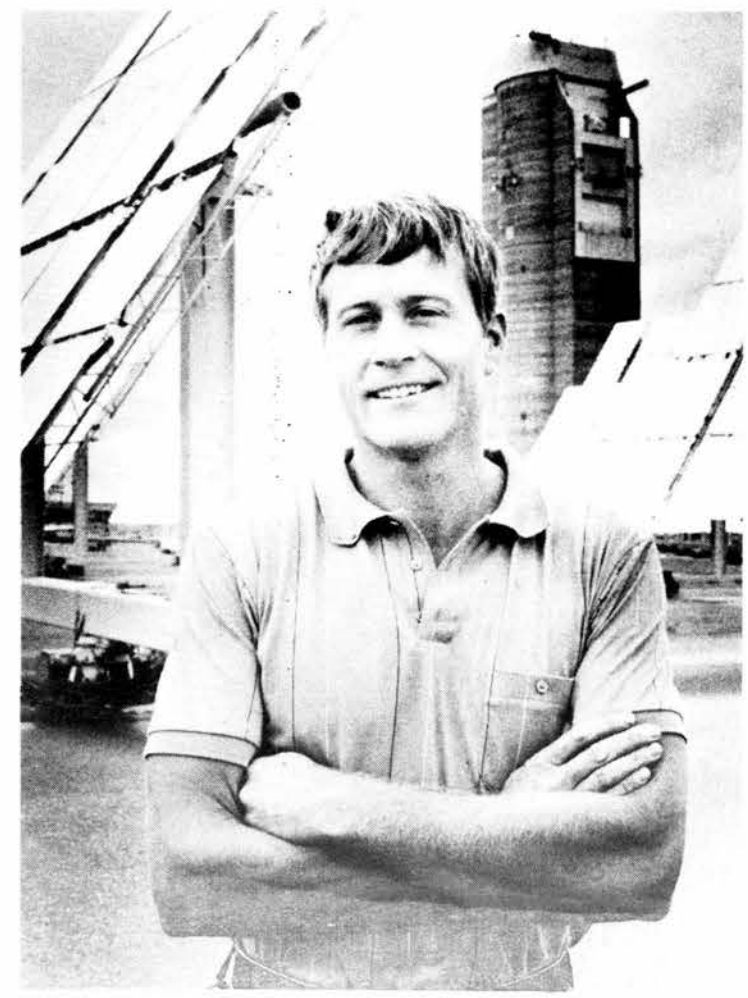


George Bott (5268) 10

Bill Byroads (8446) 25

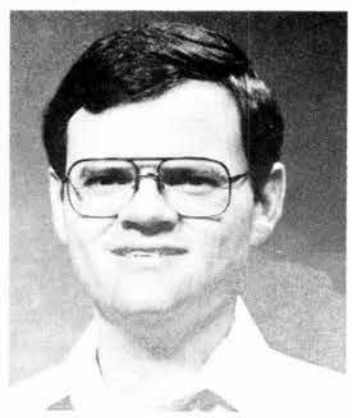


Ted Nowicki (3424) 10

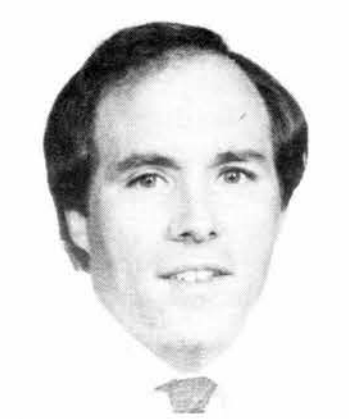


Jay Holton (6222) 20

Ken Henry (8444) 25

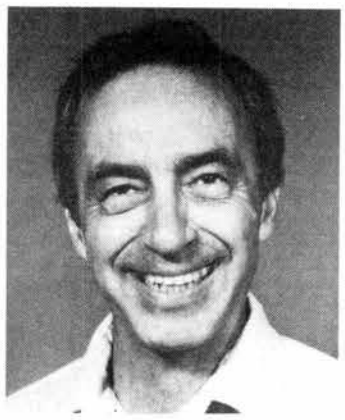


Bill Richard (5268) 10



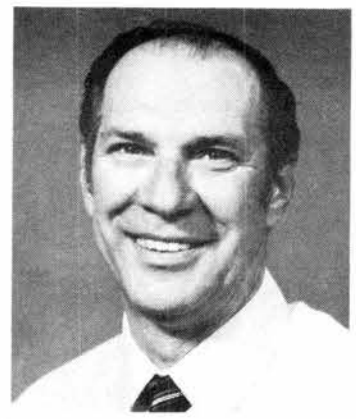
Russ Miller (8131) 10

Bob Pilkey (8186) 10

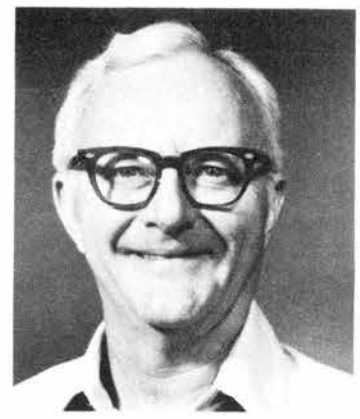


Calvin Rogers (5324) 30

Lossie Robertson (3731) 10

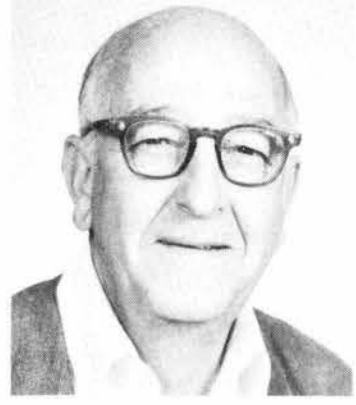


Don Burns (2542) 30

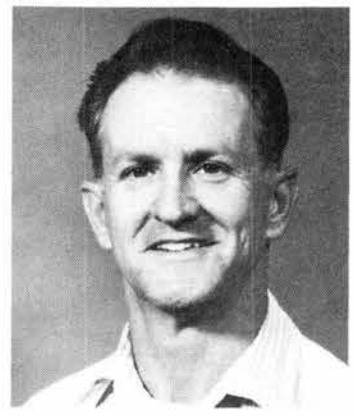


Lewis McEwen (7132) 30

Ed Lane (2122) 30



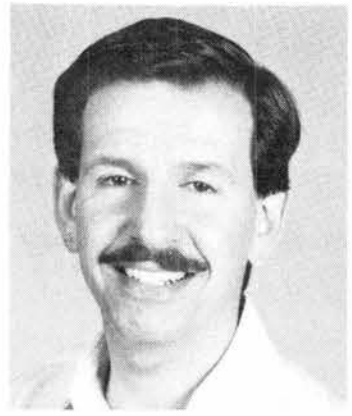
Bob Miller (8432) 25



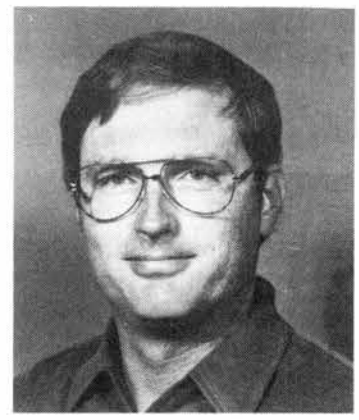
Dave Shank (5122) 25

Gene Ives (8100) 30

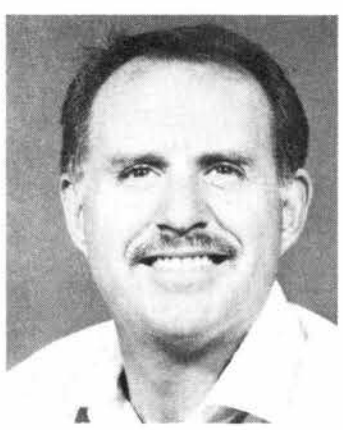
Dona Crawford (8235) 10



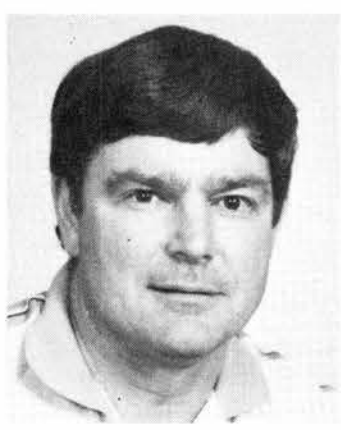
Alan Kerstein (8363) 10



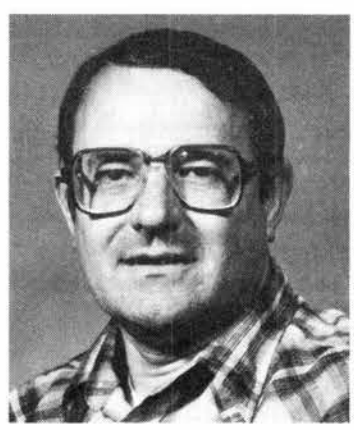
Ron Haid (2854) 20



Gene Lisotto (5153) 25

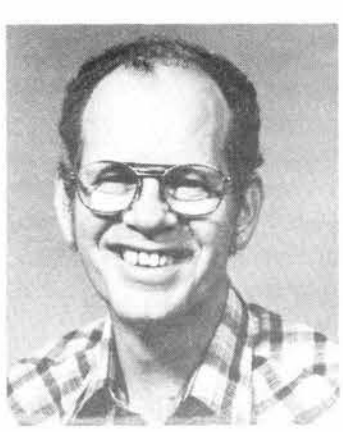


Pete Witze (8362) 20

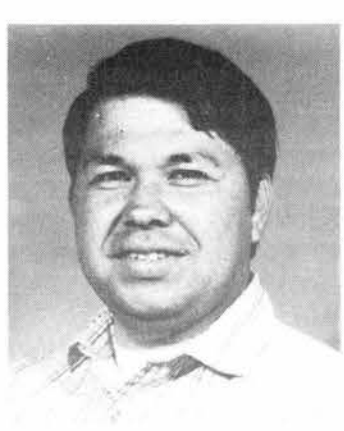


Dick Houser (6222) 25

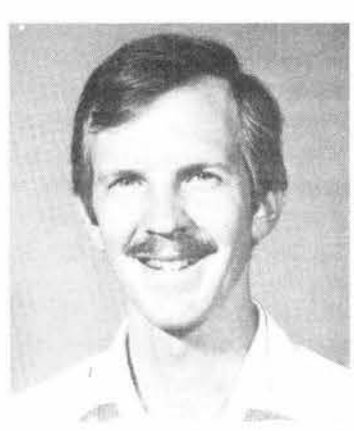
Julie Rhoden (3733) 20



Peter Rand (1813) 25



George Laguna (2534) 15



Randy Simons (5324) 10

Family Day Theme Harks Back to Harry

In 1949 Harry Truman urged AT&T (the Bell System) to take over direction of the four-year-old Sandia Laboratory, up to that time administered by the University of California.

On May 13 of that year, Truman offered a pithy statement about Sandia's role in national defense, in letters written to Leroy Wilson, president of AT&T, and to O. E. Buckley, president of Bell Telephone Labs. In these letters, Truman described Sandia as a "vital segment of the atomic weapons program" and wrote: "In my opinion you have here an opportunity to render an exceptional service in the national interest." It is this sentence that contains the theme of this year's Family Day, coming up on Oct. 18.

The theme, ". . . exceptional service in the national interest," is certainly grand, profound, and all-encompassing. Old-timers at Sandia may see the mission as an obvious one — even today. Their memories contain an elaborate network of names, dates, places, R&D breakthroughs, and field-test operations (such as Phalanx, Fulcrum, Tuggle, Nougat, Plumbbob, Wigwam, and Buster-Jangle) that may evoke a plain and simple response: "Of course, that's our Labs, serving the good old U.S. of A."

But wait, 38 percent of Sandians weren't yet born in the year those words were uttered! And 76 percent of current Sandians (figures as of December 31, 1985, courtesy of Personnel Division 3532) were probably too young (18 years old or less in 1949) to be employed at the time. (But no one's compiled data on how many of us even recognize Bob Henderson's name, for example.) (Ok, he was a Sandia VP and a major figure in early nuclear weapon development.)

These statistics may help to underscore that Family Day is not just a chance to show your family the "Far Side Gallery" posters over your workbench, to put your computer printer through its paces, to own up to filching a food processor from the home kitchen for a lab experiment, to show off your mile-long supply of cables, or to test out cruise control in Coyote Test Complex. For more than one-third of Sandians, this will be their first Family Day (the last one was held five years ago), and their first chance to visit many labs and offices — other than through vicarious treks via the pages of LAB NEWS.

It was also Harry Truman who said: "When they told me yesterday what had happened, I felt like the moon, the stars, and all the planets had fallen on me."

That particular quote was not about the Sandia takeover; it was uttered the day after he became President, in April of 1945. However, the weight of the quote can very well apply to the impact felt by the Family Day Committee in organizing the day-long event.

The committee is coordinating efforts in putting up common exhibits to make it easier to tie in with the theme — and to update it, for example, with the more recent focus on energy research. Your help is needed: to fill in the gaps from the "Z" Division days, through "clean rooms" and "knapsack code-cracking," to PBFA and SDI.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

1. Limit 20 words, including last name and home phone.
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8½ by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same ad.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

TIGA FUNCUP WINDSURFER, from beginner to expert, was European board of the year, $475 w/sail tube. Ginn, 883-0004.

GE ELECTRIC RANGE, self-cleaning oven; large wooden table; Kenmore portable sewing machine; monomatic toilet; pedestal-type wash basin. Houghton, 299-3386.

TWO BIG-O TIRES, P-215, 75-R-15, $10/ea., Two 195/70 HR 14, $10/both. Padilla, 877-2116.

10" TRIAXIAL SPEAKERS, one pair, in 15" x 24" x 10" enclosures, $30. Volk, 299-1702.

HIKING/CLIMBING BOOTS, Munari Norstar Belluno, Vibram soles, size 9N, new $40, sell for $10. Schkade, 292-5126.

TABLE & FOUR CHAIRS: 42" round, medium wood tone, 4 legs; round chairs, pedestal base, swivel, tweedy upholstery with black vinyl trim; $110/set. Hovorka, 299-0224.

GOLF CLUBS, men's size; 2-PW irons; 1, 3, and 4 woods; $100. Harrison, 292-6856.

SECTIONAL COUCHES: two pieces, tan velour w/brown pin stripes, $450 OBO. Soo Hoo, 294-0268.

ROPER DISHWASHER, runs but leaks, $25. Preston, 821-8028.

19" COLOR TV, remote, needs repair, $40. Fowler, 247-9305.

AIR CONDITIONER, GE, window type, $95; free kittens. Muench, 881-7103.

MOTIVATION TAPES, sales, 7 to choose from, purchased 8/85 at Dave Johnson seminar, $40/ea., $250/all. Archuleta, 898-6203.

HIDE-A-BED SOFA, full size, brown/gold, $150; sectional sofa, off-white, $50; credenza, 54" x 18", walnut veneer, $40; table lamp, $10. Harris, 299-6606.

FISHING HUT, Mitchell camper, for long pickup bed, $1200 OBO. Curry, 864-7730.

SEWING MACHINE, Kenmore 10-stitch w/case, used once, $299 new, asking $125. Williams, 299-8986.

COMPLETE DARKROOM: enlarger, washer, dryer, etc., $200; indoor electric barbeque, $25. Horton, 883-7504.

A/C, 2-SPD. MOTORS, $10; 27" x 50" aluminum mini-blind, $6; bar stools, $3; end tables; bedroom set; kitchen chairs. Koletar, 255-4751.

REAR PICKUP BUMPER, Hercules, 12,000 lb. pull, 1200 lb. tongue weight; camper, cabover, stove, oven, icebox, porta-potty, jacks. Stewart, 298-3332.

STROFFEL SOFA, plaid, zipper cushions. Serna, 292-2564.

TURNTABLE, Dual 510 semi-manual belt drive, new Ortonfon cartridge worth $65, manuals, all for $95. Brosseau, 836-7329.

ALTEC SPEAKERS, Model 816, home version of "Voice of the Theater System," digital-ready plus, low distortion at high volume, $325. Frost, 293-4676.

TYPEWRITERS: Royal Custom Ultronic, electric; Remington, standard; Smith Corona, portable, electric; need work, best offer. Harvey, 242-1619.

ROLL-AWAY BED, $60. Miyoshi, 821-9118.

WROUGHT IRON 18" TABLE and 2 matching chairs, $50; coffee table, $35; microwave, $195. Vigil, 821-8059.

D-41 MARTIN GUITAR w/hard case, left-handed, $1800. Perryman, 281-3020.

DINETTE, 42" diameter smoked glass, 4 swivel chairs, $190 OBO; recliner, medium brown, corduroy upholstery. Mooney, 281-2612.

VANITY DRESSER w/chair, for girl's room, $10. Gentry, 298-3574.

GI GASOLINE CAN w/flexible metal spout, 5-gal., metal, $6. Allen, 296-6453.

GO-CART, gas motor on Sears self-propelled reel-type mower, $15. Pitcher, 292-4091.

CANNING JARS, quart size; new double air mattress; Sunbeam automatic toaster; metal utility cabinet; electric grinder; large bolts. Levan, 821-0980.

EQUALIZER HITCH for big station wagons and big cars, $100. Harris, 255-6577.

PROPANE TANK, 11 lb., w/regulator, new, never filled, $40 OBO. Strip, 292-7490.

FRANKLIN STOVES, one new, one used, $150 total. Williams, 281-3844.

WOODEN BABY CRIB w/mattress, bumper, sheets, $120; playpen, $8; baby bath, $5; high chair, $20; clothes; miscellaneous. Montano, 294-4238.

DIAMOND RING, lady's, 1 karat, consists of cluster of 21 diamonds, size 7. Tomek, 299-0471 after 5:30.

HAND-QUILTED THROW PILLOWS, 3, earth tones, 18" square, for sofa or bed, $15/ea. Burstein, 821-6688.

TENT TRAILER, Palomino, sleeps 6. Herther, 298-4823.

SPRINGER SPANIEL PUPPIES, can be hunters or children's pets. Westman, 881-0471.

CAMPER/TRUCK BOOT, $10; desk, $40; refrigerator, $100; living room chair, $50; ottoman, $30; sturdy 5' steel table, $45. Falacy, 293-2517.

TIRES, set of 4, steel-belted, Monarch, P185/80R13, low mileage, $160 OBO. Hendrick, 292-8147.

BEDROOM SET, queen-size, poster bed, dresser w/mirror, chest, nightstand, $800 OBO. Alaniz, 294-0480.

CANOPY BED, antique white, $75; 2 double beds, $25/ea. Deveney, 296-1187.

COOK TOP, 30", gold, $25; zero-clearance fireplace, complete, $75; three 24" oak barstools, $20/ea; stroller, Maxi-Taxi, $20. Ashley, 298-5727.

DOUBLE BED, $60; nightstand, $30, manifold carburetor and exhaust system from '73 Ford 390 truck, $60. Zirzow, 294-7296.

HOTPOINT REFRIGERATOR, green, 14 cu. ft.; Frigidaire electric stove and dishwasher; Roper double oven, self-cleaning, electric stove. Kelly, 255-7226.

SEARS SEWING MACHINE, all attachments, seldom used, $100; 90" sofa, $100. MacInnis, 898-1628.

TRANSPORTATION

'71 VW SQUAREBACK, runs, $200. Shunny, 265-1620.

'81 VW DIESEL RABBIT, AM/FM, AC, new tires, shocks, struts, brakes. Jackson, 299-2430.

'82 JEEP CJ-7 LAREDO, 34K miles, 5-spd., 6-cyl., hardtop, PS, PB, $8500. Rutledge, 268-3262.

'83 GOLDWING INTERSTATE, AM/FM cassette, CB intercom, new Elites, new battery, 16K miles, one owner. McEwen, 821-1374.

'83 HONDA XL600R motorcycle, on/off road, 1.8K miles, $1500. Snyder, 883-4702.

'80 PLYMOUTH HORIZON, 4-dr. hatchback, 67K miles, good second car, $1300. Mead, 869-6124.

'81 HONDA GOLDWING INTERSTATE, black, AM/FM cassette, extras, 35K miles, $2700. Porter, 268-0287.

'80 DATSUN 310GX, 2-dr., AM/FM, 4-spd., new brakes, $1875. Fenimore, 298-8052.

'68 CAMARO, 327, AT, PS, original throughout, $5000 OBO. Brusseau, 294-9563.

'74 CHEV. MONTE CARLO, radials, PS, PB, PW, tilt wheel, Blaupunkt AM/FM cassette stereo, $1200. Harrison, 292-6856.

'81 SUZUKI GS850G, shaft drive, 8K miles, Vetter fairing, 2 helmets, $1000; large metal desk, $40. Chavez, 292-5475 or 299-5102.

'64-1/2 MUSTANG CONVERTIBLE, red w/white top, PS, PB, AC. Stewart, 298-3332.

'77 PONTIAC PHOENIX, AC, AT, 4-dr., 84K miles, new radials, $2100. Stuckey, 881-0156.

'76 250 KAWASAKI, 3-cyl., low mileage. Pimentel, 823-2934 after 5.

'73 JEEP WAGONEER, AC, PS, PB, trailer hitch, 77K miles, $2000. Edrington, 881-2395.

'84 SPORTSTER, $3900; '76 Gran Marquis, $1800; '74 Gran Torino, $800; '74 Honda 550/4, $600; '69 Mach-1, $1500. Leonard, 255-7725.

'74 CORVETTE STINGRAY L82, all options, orange exterior, tan leather interior, $6500. Gentry, 298-3574.

'86 MAZDA LX PICKUP, white, long bed, 5-spd., AM/FM cassette, matching topper, 7.5K miles, $6900 OBO. Fowler, 298-4442.

'85 SUNSTREAM MOTORHOME, 27', rear double bed, split bath, sleeps 7, most options, triple air, below NADA book. Calocci, 822-0371.

'81 DATSUN 310ZX, 5-spd., 1 owner, low mileage, $2500. Bremer, 821-6088.

'79 FORD F-100 1/2-TON TRUCK, V8, 3-spd., AM/FM cassette, cruise, shell, $2600. Tessler, 296-7587.

5TH WHEEL TRAVEL TRAILER, 26', self-contained, AC, B&W TV, microwave, hitch, $6995. Sieglitz, 898-5939.

'81 BUICK RIVIERA, 34K miles, fully loaded, electric sunroof, V6, extended transferable 50,000 mile warranty, 19 mpg. Arana, 299-1214.

'72 DODGE 3/4-TON PICKUP w/camper shell, AT, PB, PS. Phillips, 299-7074.

'85 LASER XE, black, silver interior, turbo, fuel injected, complete electronic readouts—even talks, 5/50 warranty, under 11K miles, $12,000. Valdez, 844-3080.

'74 DUSTER, AT, AC, PB, PS, slant six engine, below book, $450. Trump, 299-5162.

'77 OLDS CUTLASS SALON, 70K miles, 2-dr., rebuilt transmission, new radial tires, $1700 OBO. Hall, 299-0009.

'85 KAWASAKI VULCAN 700cc, adult-owned, garaged, $3500 new, sell for $2575. Collins, 266-5868.

'72 VW BUS w/'73 engine, $1200 OBO. Strip, 292-7490.

'80 CHEV. 4X4, 4-spd., dual tanks, 350, $4500. Shambo, 294-8530 or 293-1649 after 8.

'78 OLDS 88 LIMITED EDITION, Holiday series, bucket seats w/console, 2-dr., white, NADA wholesale, $1600. Fellerhoff, 884-5061.

'75 DATSUN PICKUP, short bed, AC, matching custom camper shell, $2095. Falacy, 293-2517.

'81 HONDA CM400T, medium-size street bike, 8K miles, best offer. Scheffer, 294-3434.

'84 DODGE 600, turbo, electric sunroof, cruise, AT, AM/FM cassette, tilt wheel, all power options, extended warranty transferable, $8200. Deveney, 296-1187.

'82 CITATION, 2-dr., hatchback, X-11 performance package, 4-spd., AC, PS, PB, AM/FM, tilt wheel, 43K miles, $3200 OBO. Shirey, 298-6362.

SCHWINN 10-SPEED bike, $40 OBO. Heifetz, 881-4613.

'85 DODGE CARAVAN SE, 2.6L, AC, PS, AT, 5-passenger, 6.2K miles, $10,400. Wilcoxen, 296-8295.

'83 HONDA INTERCEPTOR, VF750, V-45, Vance & Hines exhaust system, $2250 OBO. Healer, 298-6967.

TRIUMPH MOTORCYCLE, $2000; '77 Toyota Landcruiser, $2500. Strait, 842-1695.

'84 BRONCO II, 4-wheel drive, XLT package, 5-spd., low miles, $8500. White, 293-2219.

REAL ESTATE

SANDIA HEIGHTS SOUTH, 1.1-acre lot, mountain views. Howard, 266-6411 evenings.

3 BDR., RIDGECREST AREA, close to base and schools, 2 baths, double garage, large bedrooms, open floor plan, below appraisal, $86,500. Mauldin, 293-3763.

3-BDR. HOME near Lomas and Tramway, 1680 sq. ft., 1-3/4 baths, pitched roof, double garage, sprinklers, 9-1/2% assumable loan, $95,000. Trellue, 292-7369.

DUPLEX located in resort area of NM, sell or trade. Pimentel, 823-2934 after 5.

2-BDR. MOBILE HOME, partly furnished, near base at Shaw Mobile Home Park, 11000 Gibson SE, $8800. Atencio, 881-6945.

TOWNHOUSE, 2-bdr., 2 baths, fireplace, 2-car garage w/opener, near golf course. Woodall, 822-0060.

1.3 ACRES, El Pinar Estates, 14 miles east, off frontage road; wooded; electricity, phone lines on property; $8000. Perryman, 281-3020.

5 ACRES, off Frost Road, faces south, protective covenants, water, power, view. Zanner, 281-1789.

'80 MOBILE HOME, Centennial, 14' x 55', energy efficient, $8600. Williams, 281-3844.

CUSTOM 4-BDR. HOME, den, 3-car garage, 2600 sq. ft., near I-40 shopping, separate master bedroom, $131,500, assumable FHA loan, $54,000 C.T.L. Collins, 266-5868.

10 ACRES, off South 14, Manzano Springs, trees, stream, meadow. Bargman, 842-9735.

UNM AREA, 5-BDR., 2-3/4 baths, recreation room, double garage, 2640 sq. ft., $121,000. Arthur, 256-7359.

WANTED

FOUR DINING CHAIRS, oak frame w/upholstery. Hovorka, 299-0224 after 5.

COMMODORE 64 COMPUTER systems, need 2. McGuckin, 299-1342.

MARK 10B capacitive discharge ignition. Herther, 298-4823.

HOUSEMATE, male, nonsmoker, 2-bdr. townhouse, 2 baths, 3 mi. from base, $250. Shambo, 294-8530 or 293-1649 after 8.

HOUSESITTER, needed for 3 weeks, early August, feed cat, do watering, NE Heights area. Brown, 821-7553.

Brunch/Swim Set for July 13

ANOTHER OF THOSE super Sunday brunches is set for July 13 from 11 a.m.-2 p.m. For only $4.95, you have your choice of ham, sausage, baron of beef, scrambled eggs, hash browns, green chile, fruit salad, salad bar, and more. Children under 12 eat for half the already-low price, and you can dine inside or out on the patio. Plan to make a day of it — bring your bathing suit and enjoy a dip afterward in one of those four cool pools. What a way for the whole family to enjoy a sizzling summer Sunday!

CELEBRATE INDEPENDENCE, liberty, and justice for all tomorrow at the big 4th of July party in the pool/patio area from 11 a.m.-6 p.m. The Club is pulling out all the stops on this one with an a la carte buffet featuring hamburgers, hot dogs, BBQ beef and ribs, baked beans, potato salad, macaroni salad (for Yankee Doodle?), etc., served from 12-5. Special prices on drinks, and 50-cent beer too. The Albuquerque Municipal Band, 100 strong, provides "Stars and Stripes Forever" music from 12-2 to get you in the mood. Games for folks of all ages begin at 2 — penny and nickel dives in the pool, a balloon toss, Simon Says for the small fry, etc. And wait'll you get a load of the Coronado Aquatic Club's dunking machine! This bash is guaranteed to give you a slam-bang start for the three-day holiday weekend.

FANS OF CAC SWIMMERS have a couple of chances next week to cheer on their team. An away meet pits Aquatic Club members against Tierra del Sol on July 8 at 1:30 p.m. The next Saturday, July 12, our intrepid pool sharks meet the Albuquerque Tennis Club on home surf at 8:30 a.m.

THE TWO-FOR-ONE dinner special on Friday, July 11, features prime rib or shrimp — two dinners, your choice of entree, for the unheard-of price of $14.95. Afterward, it's country/western lessons from 7:30-8:30 to get you tuned up for dancing to the c/w strains of the Isleta Poor Boys from 8:30-12:30. Call the Club office, 265-6791, for dinner reservations.

THE WORD IS OUT . . . or so it seems, since more and more folks are showing up for Singles Night at the C-Club. No question, it's a great place to meet new friends. Another memorable evening is in store on Thursday, July 17, right after work. Free munchies from 5-7, and the usual 50-cent beer and margaritas all night. Dancing music by Vince and Sounds Unlimited from 6-9. Put it on your calendar, and come out and have a ball!

IF GOLDEN OLDIES are your thing, here's looking at *you*, kid! That's right . . . it's the return of Don Lesman and his big band sound on Friday, July 18. Don and the group will play those old familiar tunes (with real melodies, and words you can understand) for dancing and/or listening from 8-11:30. Beforehand, enjoy the Friday night buffet (baron of beef, fish, and full salad bar) for a very reasonable $6.95. Don't forget to call the Club office to reserve your space in the buffet line.

THE THUNDERBIRD BOARD of Directors meets Monday, July 21, at 2 p.m. at the Club. All T-Birds are welcome, says honcho Charlie Kaspar.

FARAWAY PLACES with not-so-strange-sounding names can be yours if you sign up for some of the tantalizing trips on tap from the C-Club Travel Committee. Here are a few of them:

Gaming Tables and London Bridge — Now that's a real combination! The gaming tables are in Laughlin, Nev., and London Bridge is in Lake Havasu City, Ariz. A trip scheduled Oct. 13-16 takes you to both places. You can bet there'll be no dull moments on this one. (We can't tell you *how* to bet in Laughlin, however.) For just $150/person, you get three nights at Laughlin's Edgewater Casino/Hotel, deluxe motorcoach fare (including a day of sightseeing in LH City), one free breakfast or lunch buffet of your choice, taxes, tips, and admissions. Reservations deadline is Aug. 12.

Red Cliffs and Golden Cottonwoods — A breathtaking twosome, if there ever was one. Canyon de Chelly provides the spectacular scenery Oct. 26-27. A jeep tour of the canyon lets you explore ancient Indian ruins, including outstanding petroglyphs and pictographs. The $98/person price tag includes charter bus fare, one night at the Thunderbird Lodge, a picnic lunch at Wheatfields Lake, the jeep tour, continental breakfast the first day, and a stop at the historic Hubbel Trading Post.

Cameras and Aspens in the Fall — This duo goes together like horse and carriage, ham and eggs — get the picture? A bus trip, set for Sept. 27-30, provides plenty of opportunities for all you photographers to get some first-class shots of magnificent aspen stands at the peak of their fall color. You'll head for Telluride, Colo., the first day, with lots of stops along the way to admire the scenery and take pictures. From Telluride you'll go north over the Dallas Divide and then south on the "Million Dollar Highway" to Ouray. From there, it's on to Silverton for a two-hour lunch break before traveling on down the road to Pagosa Springs. Photographers' stops along the way include Purgatory Ski Area, Honeyville Farms, and Vallecitos Reservoir. Back in New Mexico, enjoy the high country around Chama and Tierra Amarilla as you head toward Taos for a two-hour break before traveling the "high road" through Peñasco and Truchas to Chimayo. At Chimayo, enjoy the renowned cuisine at Rancho de Chimayo before your return to Albuquerque. The $145/person fee includes charter bus fare, accommodations in Telluride (two nights) and Pagosa Springs (one night), three continental breakfasts, one lunch on the bus, and dinner at Rancho de Chimayo.

Passion Play and Silver Dollar City — Maybe this is an unlikely combo, but you'll see them both and much, much more if you head for the Ozarks Oct. 18-24. This one includes all sorts of attractions in three states, including museums specializing in western art and Cherokee history, outdoor shows (including the aforementioned Passion Play, and Shepherd of the Hills outdoor drama), sightseeing in a replica of an Ozark pioneer settlement (Silver Dollar City), not to mention that beautiful fall foliage along the way. The $637/person price includes round-trip air fare to Tulsa, six nights' lodging, two special dinners, hillbilly and popular music shows, admission fees — including the outdoor shows, flight insurance, taxes, and tips. Sign up by Sept. 15.

AUTUMN SCENES like this one are yours if you sign up for any of three C-Club trips coming up in September and October: an aspencade to Colorado and northern New Mexico, Sept. 27-30; the Ozarks, Oct. 18-24; and Canyon de Chelly, Oct. 26-27.

Welcome

Albuquerque
Richard Allen, Jr. (1642)
Jessica Shaffer (3144)
Arizona
Lawrence McCartney (7522)
California
Eden Tadios (1633)
Mississippi
Mark Price (2312)
John Williams (2345)
New Mexico
Timothy Bates (324)
Cynthia Huber (2629)
Pennsylvania
Mark Beader (2334)
Tennessee
John Matthews (2514)
Texas
John Macha (1632)
Carl Sicking (7543)

SIX SANDIANS were winners in a communications contest sponsored by the United Way of Greater Albuquerque to honor 1985 campaign volunteers. Lining up for the UW photographer recently were (front row, l to r): Bruce Hawkinson (3162), Sieglinde Neuhauser (6321), Jake DeVargas (3510), Julia Gabaldon (3523), and Rod Geer (3161). Kent Biringer (6257) is in back. They won in the following categories: Bruce, feature writing and special events; Sieglinde and Jake, special events; Rod, special communications; Julia and Kent, training. (Jake chaired the ECP publicity effort at Sandia.) United Way also gave special recognition to Sandians who served on UW's allocation panels: John Covan (7555), Regina Hunter (6431), Gerald Nelson (1823), Fidel Perez (7481), Steve Ross (1000), and Emma Smith (2831).